

PROXIMATE CHEMICAL COMPOSITION AND FATTY ACID CONTENTS OF 37 FINFISH SPECIES OF THE SOUTHEASTERN UNITED STATES

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INTRODUCTION

This brochure contains values determined for proximate chemical compositions and major fatty acid contents for 37 finfish species that are harvested or available in the Southeastern United States. The data tables specify the number of different samples on which the mean composition values are based and mean values for length and weight of each species. Protein, moisture, and ash were determined using AOAC procedures (AOAC, 1985) and fat was determined by a chloroform-methanol extraction method (Folch et al., 1957). These are average values for raw fillets, most of which are derived from NOAA Technical Report NMFS 54, "Proximate and Fatty Acid Composition of 40 Southeastern U.S. Finfish Species". The procedures for preparation of fatty acid methyl esters and for analysis using a gas chromatograph with a capillary column are described in the subject report (Gooch et al., 1987).

The report referenced above can be consulted for additional information on analytical procedures and for more detail on the individual analyses and ranges of values. The report also contains analytical results for fillets cooked by a standard procedure. The cooked fillets were used by a trained sensory panel to evaluate species edibility characteristics. Some of the original 40 species, with limited fatty acid data, are not included here. Chemical compositions determined for several important underutilized species of the Gulf of Mexico were added to this brochure. The scientific names of the 37 species reported here are listed in the appendix.

Fatty acid profiles were reported as weight percent of total fatty acids in the report referenced previously. For this brochure they have been converted to grams of fatty acid per 100 grams of edible tissue using the equation derived by Weihrrauch et al. (1977). This is consistent with U.S. Dept. of Agriculture publications and is a form more useful to nutritionists.

We recognize that additional data are required to adequately describe the seasonal and geographic variations in chemical compositions of species, but we believe that the data summarized here can be useful to consumers, dieticians, and food scientists.

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NOTE: The NOAA Technical Report NMFS 54 reports results for some sampling dates containing either proximate or fatty acid data, but not both. Total lipid content and fatty acid profile are both needed to calculate fatty acids as g/100g of tissue, the form most useful to consumers and dieticians. Therefore, some of the data from TR 54 could not be included in this publication. New data became available and were added for some species. Thus, the total number of samples for a given species may be the same, but the means may be slightly different.

In general, fish weighing less than 2.5 kg (5.5 lb) each were grouped as required to give randomly composited fillet samples of at least 800 grams for sensory plus chemical analyses. Most of the samples reported here for sharks, groupers and larger recreational fish (e.g. king mackerel, crevalle jack, sheepshead) were from individual fish.

SPECIES	Black Sea		Gulf	Channel*	Atlantic	
	Bass	Bluefish	Butterfish	Catfish	Croaker	Dolphin
No. of Samples	2	4	4	3	4	3
Mean L, cm	34.80	40.10	16.00	36.30	25.30	68.40
Mean Wt, kg	0.61	0.93	0.10	0.55	0.20	2.83

PROXIMATE COMPOSITIONS (g/100g)

Protein	18.0	20.0	20.0	16.2	18.0	20.2
Moisture	81.3	77.5	77.5	82.1	77.3	79.7
Fat	0.7	2.4	3.9	2.4	2.9	0.8
Ash	1.4	1.1	1.2	1.0	1.0	1.2

FATTY ACIDS (g/100g)

14:	0.005	0.064	0.137	0.045	0.046	0.005
15:0	-	-	-	-	-	-
16:0	0.101	0.491	0.820	0.377	0.667	0.115
18:0	0.043	0.154	0.237	0.102	0.171	0.079
16:1n7	0.018	0.166	0.127	0.119	0.323	0.010
18:1n9	0.060	0.346	0.632	0.489	0.364	0.056
18:1n7	0.016	0.083	0.116	0.098	0.082	0.014
20:1n9	0.004	0.035	0.102	0.030	0.022	0.002
22:1n11+13	0.000	0.006	0.002	0.001	0.006	0.000
22:1n9	0.003	0.002	0.035	0.001	0.003	0.000
18:2n6	0.004	0.039	0.031	0.053	0.011	0.005
20:4n6	0.024	0.033	0.072	0.069	0.054	0.022
22:4n6	0.006	0.008	0.027	0.009	0.021	0.000
20:5n3	0.027	0.083	0.127	0.076	0.125	0.022
22:5n6	0.010	0.011	0.039	0.029	0.014	0.016
22:5n3	0.012	0.050	0.100	0.053	0.057	0.009
22:6n3	0.121	0.174	0.380	0.094	0.125	0.196

*Wild catfish, not cultured.

Southern Flounder	Goosefish (Monkfish)	Gag Grouper	Yellowedge Grouper	White Grunt	Harvest- fish	Speckled Hind
2	2	3	2	3	3	3
41.40	ND**	70.40	74.55	33.20	18.40	47.60
1.01	ND**	4.70	4.71	0.81	0.21	2.59
17.4	16.2	21.0	19.3	20.5	18.9	21.1
82.4	84.5	76.8	79.2	80.9	78.0	75.5
0.7	0.6	2.2	1.3	0.7	2.4	4.7
0.9	0.9	1.3	1.1	1.1	1.2	1.1
0.009	0.003	0.060	0.020	0.007	0.057	0.149
-	-	-	-	-	-	-
0.098	0.065	0.482	0.188	0.100	0.516	1.305
0.027	0.027	0.152	0.064	0.051	0.186	0.329
0.023	0.010	0.152	0.039	0.017	0.048	0.441
0.043	0.049	0.317	0.096	0.066	0.447	0.726
0.014	0.011	0.062	0.032	0.017	0.054	0.111
0.003	0.003	0.020	0.036	0.003	0.047	0.066
0.001	0.001	0.004	0.027	0.002	0.010	0.002
0.000	0.002	0.003	0.006	0.000	0.014	0.013
0.009	0.005	0.016	0.010	0.004	0.013	0.025
0.013	0.015	0.051	0.033	0.048	0.056	0.051
0.002	0.002	0.014	0.009	0.011	0.019	0.016
0.018	0.025	0.065	0.036	0.033	0.053	0.087
0.006	0.005	0.023	0.017	0.010	0.032	0.032
0.014	0.007	0.039	0.031	0.014	0.046	0.065
0.095	0.090	0.276	0.209	0.088	0.235	0.403

**Not Determined.

SPECIES	Crevalle Jack	Southern Kingfish	Ladyfish	Chub Mackerel	King Mackerel	Striped Mullet
No. of Samples	4	2	3	5	2	5
Mean L, cm	46.60	29.20	41.30	23.70	94.80	37.00
Mean Wt, kg	4.95	0.30	1.04	0.19	5.53	0.75

PROXIMATE COMPOSITIONS (g/100g)

Protein	21.1	18.7	22.7	21.8	21.7	21.0
Moisture	74.3	77.3	73.0	72.0	76.6	74.4
Fat	3.9	4.5	4.4	5.5	1.7	5.1
Ash	1.3	1.1	1.2	1.5	1.4	1.0

FATTY ACIDS (g/100g)

14:0	0.067	0.096	0.074	0.132	0.026	0.285
15:0	-	-	-	-	-	0.220
16:0	0.895	1.245	1.164	1.131	0.389	1.143
18:0	0.324	0.198	0.310	0.389	0.157	0.118
16:1n7	0.230	0.695	0.310	0.167	0.050	0.726
18:1n9	0.649	0.833	1.064	1.031	0.268	0.255
18:1n7	0.135	0.114	0.112	0.190	0.050	0.125
20:1n9	0.021	0.024	0.034	0.098	0.018	0.009
22:1n11+13	0.004	0.008	0.002	0.007	0.002	0.002
22:1n9	0.004	0.004	0.002	0.027	0.007	0.002
18:2n6	0.085	0.016	0.026	0.063	0.014	0.060
20:4n6	0.095	0.065	0.088	0.068	0.036	0.131
22:4n6	0.023	0.025	0.026	0.012	0.008	0.016
20:5n3	0.113	0.067	0.083	0.238	0.045	0.355
22:5n6	0.029	0.018	0.024	0.045	0.017	0.007
22:5n3	0.061	0.055	0.068	0.074	0.019	0.177
22:6n3	0.258	0.175	0.251	0.720	0.131	0.136

Red Porgy	Silver Rag	Blue Runner	Rough Scad	Spotted Seatrout	American Shad
2	4	2	7	2	4
35.30	16.00	26.30	21.70	39.00	40.10
0.91	0.05	0.41	0.13	0.69	1.12
22.0	21.1	21.3	19.8	19.4	19.1
77.1	72.5	75.3	76.8	79.4	65.4
0.9	5.2	1.6	2.1	2.7	14.6
1.5	1.4	1.3	1.4	1.1	1.3
0.006	0.156	0.023	0.068	0.072	0.588
-	-	-	-	-	-
0.149	1.022	0.316	0.417	0.608	1.687
0.049	0.369	0.150	0.144	0.142	0.296
0.016	0.133	0.034	0.095	0.324	0.341
0.066	0.853	0.167	0.320	0.378	1.013
0.015	0.153	0.037	0.051	0.086	0.307
0.007	0.155	0.015	0.015	0.014	2.666
0.002	0.030	0.002	0.004	0.001	2.663
0.001	0.023	0.001	0.004	0.001	0.168
0.004	0.044	0.009	0.022	0.020	0.177
0.030	0.121	0.037	0.026	0.050	0.029
0.011	0.054	0.008	0.004	0.020	0.017
0.021	0.165	0.058	0.099	0.106	0.506
0.015	0.062	0.017	0.020	0.021	0.015
0.020	0.125	0.035	0.037	0.041	0.203
0.193	0.546	0.308	0.317	0.175	0.887

SPECIES	Atlantic		Scalloped		
	Sharpnose	Lemon	Hammerhead	Tiger	Sheepshead
	Shark	Shark	Shark	Shark	
No. of Samples	3	2	2	2	3
Mean L, cm	53.90	183.00	229.00	ND**	49.30
Mean Wt, kg	6.10*	37.05*	106.60*	104.33*	3.15

PROXIMATE COMPOSITIONS (g/100g)

Protein	23.7	19.7	23.1	19.2	21.4
Moisture	75.1	79.5	76.0	80.1	77.9
Fat	0.8	0.6	0.7	0.7	1.6
Ash	1.4	1.3	1.4	1.2	1.2

FATTY ACIDS (g/100g)

14:0	0.001	0.002	0.001	0.002	0.034
15:0	-	-	-	-	-
16:0	0.100	0.055	0.064	0.048	0.310
18:0	0.085	0.044	0.064	0.073	0.086
16:1n7	0.005	0.004	0.006	0.009	0.087
18:1n9	0.038	0.037	0.036	0.089	0.284
18:1n7	0.023	0.013	0.023	0.020	0.043
20:1n9	0.003	0.002	0.003	0.003	0.011
22:1n11+13	0.001	0.002	0.000	0.002	0.001
22:1n9	0.000	0.000	0.001	0.000	0.003
18:2n6	0.002	0.001	0.003	0.006	0.017
20:4n6	0.047	0.025	0.030	0.045	0.063
22:4n6	0.035	0.026	0.030	0.013	0.015
20:5n3	0.013	0.006	0.011	0.007	0.051
22:5n6	0.019	0.011	0.010	0.007	0.011
22:5n3	0.020	0.010	0.021	0.011	0.037
22:6n3	0.112	0.049	0.075	0.052	0.082

*Round weight estimated from carcass weight.

**Not Determined.

Gray						
Red	Vermillion		Blue	Trigger-		
Snapper	Snapper	Spot	Tilefish	Tilefish	fish	Weakfish
2	2	2	2	2	2	2
44.70	48.20	21.60	62.40	63.10	36.30	72.40
1.54	1.57	0.20	2.74	3.21	1.11	3.56
20.4	21.3	18.2	17.6	19.9	20.7	19.3
77.8	78.0	71.4	81.1	78.3	79.1	78.1
1.4	0.6	8.0	1.0	2.5	0.8	2.1
1.2	1.2	1.0	1.3	1.3	1.2	1.1
0.029	0.009	0.240	0.018	0.067	0.002	0.052
-	-	-	-	-	-	-
0.276	0.088	1.978	0.139	0.419	0.087	0.378
0.107	0.036	0.492	0.040	0.129	0.071	0.089
0.049	0.009	0.718	0.032	0.102	0.006	0.134
0.199	0.045	1.400	0.129	0.406	0.065	0.277
0.031	0.007	0.244	0.029	0.077	0.020	0.042
0.015	0.003	0.085	0.021	0.076	0.002	0.079
0.006	0.001	0.010	0.003	0.040	0.001	0.095
0.002	0.002	0.011	0.006	0.022	0.000	0.008
0.008	0.004	0.030	0.005	0.019	0.003	0.021
0.032	0.014	0.093	0.018	0.042	0.061	0.020
0.008	0.003	0.060	0.007	0.021	0.006	0.004
0.040	0.014	0.347	0.022	0.060	0.024	0.066
0.015	0.012	0.031	0.009	0.021	0.009	0.009
0.022	0.006	0.153	0.026	0.075	0.015	0.025
0.216	0.104	0.293	0.147	0.284	0.155	0.233

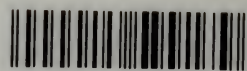
APPENDIX

Southeastern U.S. finfish evaluated for proximate and fatty acid composition.

Species (Common name)	Scientific name
Bass, Black Sea	<i>Centropristis striata</i>
Bluefish	<i>Pomatomus saltatrix</i>
Butterfish, Gulf	<i>Peprilus burti</i>
Catfish, Channel	<i>Ictalurus punctatus</i>
Croaker, Atlantic	<i>Micropogonias undulatus</i>
Dolphin	<i>Coryphaena hippurus</i>
Flounder, Southern	<i>Paralichthys lethostigma</i>
Goosefish (Monkfish)	<i>Lophius americanus</i>
Grouper, Gag	<i>Mycteroperca microlepis</i>
Grouper, Yellowedge	<i>Epinephelus flavolimbatus</i>
Grunts, White	<i>Haemulon plumieri</i>
Harvestfish	<i>Peprilus alepidotus</i>
Hind, Speckled	<i>Epinephelus drummondhayi</i>
Jack, Crevalle	<i>Caranx hippos</i>
Kingfish, Southern (Whiting)	<i>Menticirrhus americanus</i>
Ladyfish	<i>Elops saurus</i>
Mackerel, Chub	<i>Scomber japonicus</i>
Mackerel, King	<i>Scomberomorus cavalla</i>
Mullet, Striped	<i>Mugil cephalus</i>
Porgy, Red	<i>Pagrus pagrus</i>
Rag, Silver	<i>Ariomma bondi</i>
Runner, Blue	<i>Caranx crysos</i>
Scad, Rough	<i>Trachurus lathami</i>
Seatrout, Spotted	<i>Cynoscion nebulosus</i>
Shad, American	<i>Alosa sapidissima</i>

Species (Common name)	Scientific Name
Shark, Atlantic Sharpnose	<i>Rhizoprionodon terraenovae</i>
Shark, Lemon	<i>Negaprion brevirostris</i>
Shark, Scalloped Hammerhead	<i>Sphyrna lewini</i>
Shark, Tiger	<i>Galeocerdo cuvieri</i>
Sheepshead	<i>Archosargus probatocephalus</i>
Snapper, Red	<i>Lutjanus campechanus</i>
Snapper, Vermilion	<i>Rhomboplites aurorubens</i>
Spot	<i>Leiostomus xanthurus</i>
Tilefish	<i>Lopholatilus chamaeleonticeps</i>
Tilefish, Blueline	<i>Caulolatilus microps</i>
Triggerfish, Gray	<i>Balistes caprisus</i>
Weakfish	<i>Cynoscion regalis</i>





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